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ABSTRACT

Characteristics of critical thinking and creative thinking are described along with methods by which educators can encourage students in the development of these cognitive strategies. Intellectual standards applied to the critical thought process include accuracy, precision, depth, breadth, logic, and significance. Effective educators adhere to these standards, modeling the critical thinking process they expect from the student and assessing the student's thinking process accordingly. Teachers can facilitate students in learning to engage in independent and diligent thought and to come to their own understanding of complex issues. By contrast, creative thinking is characterized by a personal aesthetic with a powerful drive to wrest order from chaos and to explore original options for solving problems. Creative thinkers value and seek new approaches which include opposition and synthesis, and exhibit an inner motivation not dependent on extrinsic factors. Risk-taking and failure are accepted as part of the creative quest and seen as an opportunity to learn. Creative thinking is original, adaptive, flexible, sensitive to problems, and able to integrate complexity. It is enhanced by mental imaging and pattern recognition exercises. Cooperative learning enhances both types of thinking by encouraging tolerance of other views and reciprocity in intellectual exchange. (PRW)

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by Dr. Judy Downs-Lombardi

Paper presented at the 16th International Conference on Critical Thinking and Educational Reform, July 28-31
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What do we mean by critical thinking? by creative thinking? While many excellent definitions of both terms appear in the literature, Ruggiero (1988) offers these to aid our understanding: critical thinking can be viewed as the judgment of thought, while creative thinking can be seen as the production of ideas. Vigorous debates about both terms appear in critical thinking literature and presentations, but practical applications of thinking skills provide educators with a sense of direction and purpose.

In the 1960's, a song by Janis Ian, "Society's Child," describing a biracial relationship between a black man and white woman, stirred controversy and was banned from airplay on almost all radio stations. Like the lyrics to this song, critical thinking often stimulates thought, creating a basis for analysis, argumentation, and debate. Even some of the finest minds in the critical and creative thinking movement (e.g., Paul, Sternberg, Costa, Ruggiero, Lipman, Perkins, Tavris, Peck, Guilford, and DeBono) cannot and do not always agree on definitions. Their disagreements provide fertile soil for thought and growth.

But scholars do agree that intellectual standards for thinking must be explored, delineated, and clarified, so that practitioners and theorists alike establish a base point from which to start. As educators, we cannot know where we are going with thinking skills, if we do not know where we are and where we have been.

Some professionals see critical thinking as mystical, inexplicable, and impossible to define. Universal intellectual standards of clarity, accuracy, precision, relevance, depth, breadth, logic, and significance "must be applied to thinking whenever one is interested in checking the quality of reasoning about a problem, issue or situation" (Paul pp. 3-26).

For critical thinking scholars, clarity is the gateway intellectual standard, because unclear statements cannot be judged for accuracy or relevance. The understanding of an idea, thought, or concept is an essential, first step in analyzing and addressing it. Other concerns of critical thinkers are accuracy (is the statement true?); precision (can you give more details? be more specific?); and relevance (do these ideas connect? relate in context?).

In addition, these standards round out the list of those that must be applied to careful reasoning: depth (addressing the complexities instead of the superficialities of an issue); breadth (considering alternative points of view); and logic (does this idea make sense? does that idea follow this one?); and significance (which are the most important ideas, especially the key or organizing concepts?).

How do educators achieve and apply these intellectual standards in the classroom? Effective educators engage students in the thinking they expect, hold them responsible for the thinking they do, and model the thinking they want. The difference between good teaching and great teaching is the careful adherence to standards for thinking, as practiced and modeled by the instructor.

What am I going to teach? How am I going to teach this lesson or subject? Unlike our students, we see the end from the beginning. Through experience, we know which key concepts must be explored and implemented, the requirements students must fulfill, and the level of performance expected. Clear expectations, conveyed from teacher to student from the first day of class and throughout the course, can enrich learning and diminish frustration. Learning becomes a partnership between teacher and student.

Beginners or newcomers to the critical thinking field frequently feel bewildered, even intimidated, by the range of definitions and interpretations of critical thinking. What these novice practitioners must realize is that all educators begin somewhere, with their own questions, concerns, issues and interpretations. From this base point, with the help of colleagues and scholars, teachers can form their own rich understandings of critical and creative thinking.

Critical thinkers are never stuck, or at least not for long, when solving problems and making decisions. Like good detectives, they go back to square one or strike out in a new direction. They acknowledge that an issue might not have just 2 sides, but 10 sides, and that every angle must be acknowledged, often persistently pursued. Perseverance and strategic thinking mean more than IQ or special, intellectual ability; rather, one must think ahead, plan deliberately, and tolerate uncertainty.

Mirroring Bloom's Taxonomy, moving from simple to complex and concrete to abstract, critical thinking educators apply thinking skills to classroom design and practice. First, instructors decide on the key, organizing concepts of the course, what must be covered over what should be covered. Careful picking-and-choosing, a selectivity based on solid information and experience, can make the difference between a good classroom and a great one.

In the critical thinking classroom, whatever the topic or assignment, students have clear frameworks, expectations, criteria, and standards by which to assess their learning. Encouraged to discover, explore, and analyze knowledge--rather than simply reacting to it--they generate their own interpretations of issues. Unpopular and unusual viewpoints are welcomed, as students form a community of learners to generate their own opinions, backed by accurate information and adequate support.

Student-centered classrooms, with teachers as facilitators, guides, and exemplars of quality instruction, stimulate people to think. They teach that individuals must remain open, related and reflective, as opposed to rigid, isolated, and impulsive in their decision-making. "Not a sage on the stage, but a guide on the side," current wisdom recommends. Teachers must be willing to relinquish some of their traditional, didactic classroom control, to permit and promote better quality student thinking.

Pseudo, or shallow and superficial critical thinking approaches focus primarily on sorting fact and opinion. As Paul points out,

a "now almost totally ignored category," is that of reasoned judgment, rationally evaluating information and assumptions (1996 pp. 3.1-3.10) . Metacognition (thinking about thinking), effective questions, strategies, and checking statements for their relevance all contribute to improved thinking practice within and outside the classroom.

Some of the most effective types of questions are those that have no preconceived answers. Educators challenge their students to use regular self-assessment, teach and explain concepts to other classmates, and reinforce learning through oral sharing and articulation. Early in the course, students are given an orientation to class requirements and assignment guidelines.

Socratic questioning leads students to their own understandings. What is the issue? the embedded assumptions? What evidence do we need to understand and resolve this problem? Which alternative positions exist? Can students give specific, relevant examples? To help students think more clearly and deeply, questions must probe beneath the surface and go beyond the superficial. Not working diligently to understand complex, complicated issues only delays reasoned judgment and a thorough understanding.

Effective reasoners distinguish relevant questions from those that diminish or trivialize issues. They are more interested in "the how and why" of an issue than "the what." Reasoned thinkers display a sensitivity to biased, or loaded, questions. They reject unclear, confusing, and poorly articulated premises. They can give a sympathetic accounting of other viewpoints and value truth over ego (Ruggiero 1988).

Being keenly aware of one's own deep prejudices and approaching problems as possibilities contribute to critical thinking. Characterizing, an issue from another point of view, adopting the other person's internal frame of reference, then committing to a well-reasoned position typify the skilled thinker. Unskilled thinkers exhibit little or no depth of thought, while weak sense thinkers can reason but do so to attack, criticize, and propagandize (Paul 1994).

Poor thinkers often become veteran contradictors, eager to argue and debate at every turn, unwelcoming of other perspectives. They solve problems by circling down into an unhealthy vortex of hostility and unexpressed anger over their inability to find workable solutions. Effective problem-solvers reach out, when confronted with challenges, and look beyond themselves to enrich their evidentiary base. Socratic teachers share goals and objectives, resources, methodology and strategies, technology, and any organizing concepts that assist them in their teaching.

In examining our own thinking, Paul offers this proviso: "Many of our inferences are justified and reasonable. But of course, many are not. One of the most important critical thinking skills is the skill of noticing and reconstructing the inferences we make..." (Paul 1996 pp. 4-35). Because our assumptions and perspectives shape our perceptions and interpretations, we must draw conclusions through thoughtful consideration and responsible attitudes.

What of the creative thinking component of thinking skills? Perkins describes a snowflake model, six related but distinct psychological traits of the creative person (1989). These traits include a strong commitment to a personal aesthetic with a powerful drive toward wresting order from chaos; excelling in exploring all the options for solving a problem and valuing good questions; and mental mobility, or a desire to find new approaches to problems and thinking in terms of both opposites and synthesis.

Other traits of creative thinking detailed by Perkins are a willingness to take risks and accepting failure as part of the creative quest; seeking criticism, along with welcoming feedback and testing ideas in the marketplace; and an inner motivation, refusing to be discouraged by extrinsic restraints such as supervision, competition, or restricted choices (1989).

Barron, in research at the University of California over two decades, identifies creative, "...mental faculties [such] as adaptive flexibility, fluency of association, originality, the ability to integrate complexity, and a sensitivity to problems" (1989 p. 114). Barron urges

thinkers to develop their creative skills through mental imagery, recognizing patterns in common objects and everyday occurrences, and heighten their sensitivity to original solutions to problems.

Sternberg's "triarchic abilities test" attempts to gauge intelligence by more than academic knowledge and facts. Sternberg challenges educators and researchers to view thinking skills in terms of the survival skills used to solve the ill-defined problems of everyday living. Sternberg's test measures such qualities as non-entrenched thinking, or reasoning from a counter-intuitive premise, looking at problems from unusual or unfamiliar perspectives, and challenging both widely held and narrowly focused assumptions. Flexibility, logic, and skepticism help thinkers grasp implications and look beyond the obvious (1989 pp. 65-68).

Critical and creative thinking skills can be enhanced through collaboration and cooperative learning. Suspending judgment until hearing others' views, learning to tolerate multiple interpretations of issues, and accepting challenges to one's own perspectives can be sharpened through heterogeneous group interaction. Practicing reciprocity in intellectual exchange, knowing when to question an idea or issue, asking for additional information, and making interdisciplinary connections can be enriched in the group context.

One of the most important issues a cooperative thinking group can address is that of the credibility of sources. Individual members assist one another in testing and refining generalizations, clarifying claims, and conceptualizing a variety of approaches to problem-solving, while exploring advantages and disadvantages of solutions (Downs 1994; Ruggiero 1988). Cooperative learning takes special preparation and planning by the teacher, who must learn certain strategies to make collaborative exercises work and keep groups functioning well (Johnson, Johnson, and Holubec 1990).

The Center for Critical Thinking and Moral Critique of Sonoma State University, California, has created a strategy list of the 35 dimensions of critical thought, with affective strategies, cognitive strategies (macro-abilities), and a second list of cognitive strategies

(micro-skills). These 35 skills range from developing intellectual fairmindedness and integrity, to reading and listening critically, and exploring implications and consequences (Paul 1993). Critical thinking is more than analysis and assessment of solutions, and involves exploring insights into one's own egocentricity and narrow-mindedness, the development of intellectual humility over time.

How should beginners, novices, and those eager to know more about critical and creative thinking gain a deeper understanding of the movement and how to apply its teachings? Online services; a host of books and journal articles; local, regional, national, and international in-services and conferences; networking with other, interested professionals; crossdisciplinary study; and pursuing one's own understanding of terms and approaches can all build an effective thinking attitude.

Respecting thinking as a seasoned art, or a connoiseurship of thinking skills, can help educators develop an appreciation of the intricacies and benefits of being a responsible, reasoned thinker. According to a wise Chinese proverb, "I hear, I forget; I see, I remember; I do, I understand."

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